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STEELHEAD HARVEST ANALYSIS
1983-84

by

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Victoria, B.C.

Fisheries Technical Circular No. 64
1984

ABSTRACT

For the past eighteen years, at the end of the angling licence year, a questionnaire has been sent to fishermen who have angled for steelhead in British Columbia requesting information on their fishing activity and catch success for incorporation into the Steelhead Harvest Analysis. Over this time, there have been considerable changes in licence sales, the number of days spent fishing and provincial catch.

In the 1983-84 season, 20,576 steelhead angling licences were sold, approximately 10% of which were to nonresidents of B.C. A questionnaire was sent to 64% of licencees, and a response was received from approximately half of those contacted. Of the respondents, 74% fished for steelhead at least once and, of the active anglers, 58% were successful in landing a fish. The number of steelhead kept averaged 15% of the total reported catch for the province, ranging from 10% on Vancouver Island to 43% in the Thompson-Nicola region. Of the anglers who successfully landed a steelhead, 27% released all their fish, 67% kept between one and five fish and 6% kept more than five fish. Angling effort was highest in the Lower Mainland region marginally surpassing that of Vancouver Island, however, Vancouver Island reported the highest number of steelhead caught. Hatchery fish, caught primarily on Vancouver Island and the Lower Mainland, comprised approximately 19% of the total provincial catch with a reported harvest ratio of 25%, compared to 13% for wild fish.

There has been a decreasing trend in licence sales and active anglers over the eighteen year period, although the number of successful anglers has remained relatively constant. The provincial catch has improved significantly in recent years with this year's catch of 98,622 fish surpassing any previous records. The increase in catch is a combined result of increased stock abundance and repeated captures of released fish. Catch per angler day for the province was 0.57. Reduced possession quotas as well as steelhead release regulations have resulted in a decrease in the steelhead harvest (number of fish kept), dropping from 63% in 1970-71 to 15% in 1983-84.

INTRODUCTION

Anglers from British Columbia, Canada and the United States have reported catches ranging between fourty and one hundred thousand steelhead trout annually from British Columbia streams. Due to the low natural abundance of wild searun trout, careful management is necessary to regulate the harvest and ensure adequate spawning. The number of steelhead released has increased considerably in recent years through the institution and growing acceptance of catch and release regulations and reduced quotas. Many streams have been stocked with hatchery reared fry and smolts as a method of enhancing steelhead populations and, while numerous streams have a wild steelhead release restriction, the harvest of hatchery fish is still permitted.

Steelhead trout are caught in the commercial, sport and Indian food fisheries. The total catch is unknown but efforts are being made, through the Salmonid Enhancement Program (S.E.P.), to determine the number of steelhead intercepted by sport anglers and the commercial salmon fleet. An analysis of the number of steelhead caught by freshwater sport fishermen has been conducted annually since 1966-67 in the form of a mailout questionnaire survey. Anglers are requested to report their catch for each stream fished during the licence year (April 1 to March 31).

The resident area boundaries used in this analysis correspond with the eight regional management boundaries. Reported catch and angling effort for the Skeena region, however, has been separated into Queen Charlotte Islands and Skeena Mainland to be consistent with previous years.

SALMONID ENHANCEMENT PROGRAM

The Federal/Provincial Salmonid Enhancement Program (S.E.P.) was initiated in 1977 with the long-term objective of doubling the catch of Pacific salmon, steelhead and searun cutthroat trout by protecting, rehabilitating and enhancing fish stocks. Surveys of stocks in the late 1970's revealed that many runs of steelhead were declining, particularly in southern British Columbia. Projects are underway to restore these runs through improved management and the employment of various enhancement techniques. The provincial Fisheries Branch is also working intensively with the federal Department of Fisheries and Oceans to reduce the incidental catch of steelhead by refining the management of the commercial salmon fishery.

Enhancement techniques include the improvement of fish habitat, removal of barriers to fish migration, construction of spawning platforms to increase available spawning habitat, and placement of boulders or log cover in streams to increase rearing habitat for juvenile fish. Other techniques in a research phase include stream enrichment to increase the natural production of aquatic invertebrates; water storage in headwater lakes for release during the dry summer months to maintain optimum flow conditions for fish; and stabilization of streambanks by reestablishing riparian vegetation, reinforcing with rip-rap, or fencing to eliminate livestock.

Fish culture plays a major role in S.E.P. through annual stocking programs to accelerate the recovery of severely depleted wild stocks and by

Table 1. 1983 Juvenile steelhead released from provincial (MOE) and federal (DFO) rearing facilities.

Stream	Facility	Fry Released	Smolts Released	Predicted Adult Returns*	
VANCOUVER ISLAND					
Big Qualicum R.	Big Qualicum Salmon Hatchery (DFO)		24,500	980	
Cameron L.	Little Qualicum Salmon Hatchery (DFO)		3,700	148	
Campbell R.	O'Connor Lake Netpens (MOE)		14,700	441	s.r.
Cowichan R.	Vancouver Island Hatchery (MOE)	3,100		25	
	Cowichan Lake Netpens (MOE)		45,700	1,828	
Englishman R.	Big Qualicum Salmon Hatchery (DFO)	8,300	29,000	1,226	
Fleet Cr.	Vancouver Island Hatchery (MOE)	17,900		143	
Heber R.	Vancouver Island Hatchery (MOE)	15,000		120	
Keogh R.	O'Connor Lake Netpens (MOE)		25,100	1,004	
Little Qualicum R.	Little Qualicum Salmon Hatchery (DFO)		12,500	500	
Lens Cr.	Vancouver Island Hatchery (MOE)	18,600		149	
Millstone R.	Big Qualicum Salmon Hatchery (DFO)		12,300	492	
Nanaimo R.	Nanaimo C.D.P. Hatchery (DFO)	74,800	10,100	778	
Oyster R.	Vancouver Island Hatchery (MOE)	23,900		120	
Puntledge R.	Puntledge Salmon Hatchery (DFO)	3,400	18,600	744	s.r.
Quinsam R.	Quinsam Salmon Hatchery (DFO)	40,000	21,100	1,164	
Salmon R.	Vancouver Island Hatchery (MOE)	52,600		263	
San Juan R.	Vancouver Island Hatchery (MOE)	21,100		169	
Somass R.	Robertson Cr. Salmon Hatchery (DFO)		15,800	474	w.r.
			124,200	4,968	s.r.
Tsolum R.	Puntledge Salmon Hatchery (DFO)		10,400	416	
Ucona R.	Vancouver Island Hatchery (MOE)	47,100		236	
Upana R.	Vancouver Island Hatchery (MOE)	16,000		128	
LOWER MAINLAND					
Alouette R.	Alouette Reg. Correctional Centre (MOE)	16,200**	6,000	596	
	Fraser Valley Trout Hatchery (MOE)	2,800	15,700	642	
Ashlu R.	Tenderfoot Cr. Salmon Hatchery (DFO)	48,800		244	
	Fraser Valley Trout Hatchery (MOE)	20,000		160	
Capilano R.	Capilano Salmon Hatchery (DFO)	42,700	12,900	858	
Cheakamus R.	Tenderfoot Cr. Salmon Hatchery (DFO)	22,000		110	
Chilliwack R.	Chilliwack R. Salmon Hatchery (DFO)	65,500	113,700	5,072	
Coquihalla R.	Fraser Valley Trout Hatchery (MOE)	119,500	32,900	1,943	s.r.
Foley Cr.	Chilliwack R. Salmon Hatchery (DFO)	8,400		42	
Gold Cr.	Alouette Reg. Correctional Centre (MOE)	14,900		119	
Kanaka Cr.	Fraser Valley Trout Hatchery (MOE)	7,300		36	
Kenyon L.	Fraser Valley Trout Hatchery (MOE)	23,000		115	
Little Campbell R.	Fraser Valley Trout Hatchery (MOE)	7,300		36	
	Surrey Rearing Ponds (MOE)		6,900	276	
Marshall Cr.	Fraser Valley Trout Hatchery (MOE)	4,000	5,700	248	
Mill L.	Fraser Valley Trout Hatchery (MOE)	1,900		15	
Murray Cr.	Fraser Valley Trout Hatchery (MOE)	500		2	
Nicomeki R.	Fraser Valley Trout Hatchery (MOE)	6,900	15,400	650	
Seymour R.	Seymour River Rearing Channel-BCIT (DFO)	36,500	2,300***	333	
Silverhope R.	Fraser Valley Trout Hatchery (MOE)	32,400		259	s.r.
Shovelnose Cr.	Fraser Valley Trout Hatchery (MOE)	10,000		80	
Siesse Cr.	Fraser Valley Trout Hatchery (MOE)	34,100		273	
Squamish R.	Tenderfoot Cr. Salmon Hatchery (DFO)	8,000		40	
Whonock Cr.	Fraser Valley Trout Hatchery (MOE)	3,100		17	

Table 1 (cont'd)

Stream	Facility	Fry Released	Smolts Released	Predicted Adult Returns*
THOMPSON-NICOLA				
Bonaparte R.	Loon Creek Hatchery (MOE)	67,900	51,400	2,395
Nicola R. (Maka & Spius Cr.)	Loon Creek Hatchery (MOE)	81,600		408
CARIBOO				
Salloomt R.	Snootli Salmon Hatchery (DFO)	134,700		674
SKEENA MAINLAND & QCI				
Morice R.	Fraser Valley Trout Hatchery (MOE)	69,900		559
Pallant Cr.	Pallant Cr. Salmon Hatchery (DFO)	16,000		128
Zymoetz R.	Fraser Valley Trout Hatchery (MOE)	137,700		1,102
PROVINCIAL TOTAL:		1,385,400	630,600	33,948

* Predicted adult returns based on Tautz & Slaney, 1982, Biostandards

Fry to adult survival:	fry ≤ 1.0g	0.5%
	fry > 1.0g	0.8%
Smolt to adult survival:	summer-run	3%
	winter-run	4%

** Fish averaged 42g. Smolt to adult survival estimated at 2.2% (Royal, 1972)

***Fish averaged 36g. Smolt to adult survival estimated at 1.8% (Royal, 1972)

sustaining major sport fisheries. Steelhead fry are released in underseeded areas of streams or above barriers (i.e. waterfalls), thus, maximizing the use of available rearing habitat. Steelhead smolts are reared at hatcheries or in floating net enclosures in lakes where they are fed artifically for one year until a size of about 18cm is reached. The hatchery smolts migrate to sea upon release. The first adult returns from hatchery smolts released in 1983 will be during the 1984-85 fishing season, while fry released in 1983 will not return until the 1986-87 and 1987-88 seasons (Table 1).

Although there are planned exceptions, Fisheries Branch policy directs that hatchery reared steelhead be returned to their stream of parental origin and that, whenever possible, eggs are taken from wild fish rather than marked hatchery fish. Exceptions may be found in streams classified as "hatchery" (see below). Hatchery fish are marked by the removal of the adipose fin and have a healed scar in place of that missing part.

Concern about the impact of hatchery fish introductions on wild fish populations resulted in the development of a system of stream classification, based on expected genetic risk, to guide in the management of fish stocks. Three broad classes were developed:

Wild streams are managed to protect, maintain and enhance natural fish populations. Appropriate enhancement techniques include fry plants and short-term smolt plants using native brood stock, stream improvement to increase stream carrying capacity, and regulations to maintain the harvest.

Hatchery streams have severely depleted wild stocks and may also have damaged spawning and rearing habitat, but there is potential for angling through the annual introduction of smolts.

Augmented streams are managed to maintain healthy wild stocks while providing for a harvestable surplus through the addition of cultured fish. The risk of genetic mixing between wild and hatchery fish is minimized by using only native wild adults for brood stock. Smolts are released in the lower stream reaches where angling pressure is greatest. Hatchery adults return to their release point and are available for anglers to harvest while release regulations for wild fish ensure an upriver escapement. Stream improvement and fry stocking may also be used as a method of enhancement in augmented streams.

Sportfishing regulations are one of the most effective management strategies employed by fisheries biologists to protect and enhance steelhead stocks. Catch and release restrictions are frequently in use while complete angling closures are limited to specific areas where fish are in critical need of protection. Catch and release regulations have resulted in substantially increased spawning escapements and juvenile recruitment essential to the restoration of steelhead stocks.

Fig. 1. British Columbia resident areas.

METHOD

Information for the Steelhead Harvest Analysis was obtained from a postcard questionnaire survey of anglers who purchased steelhead licences in British Columbia. The questionnaire asked for the following information:

1. Did you fish for steelhead between April 1, 1983, and March 31, 1984, and
2. List the streams fished and, for each, the number of days fished, the number of wild steelhead kept and released, and the number of hatchery steelhead kept and released.

A total of ten resident groups were recognized: residents of eight regions of the province, residents of the other provinces and residents from outside of Canada (Fig. 1). Questionnaires were mailed to 60% of B.C. resident anglers and 96% of non-B.C. resident anglers. The returned questionnaires were analysed to determine catch, angling effort and angler distribution for all streams fished.

RESULTS

During the 1983-84 season, 20,576 steelhead angling licences were sold; a decrease of 50% over the last 18 years (Appendix 2). Lower Mainland residents made up the largest segment (35%) of steelhead licencees. Questionnaires were mailed to 64% of licencees and responses were received from approximately half of those contacted. The resulting sample group constituted 28% of all licenced steelheaders (Table 2).

Of the respondents, 74% actually fished for steelhead and, of these, 58% reported catching at least one fish. When extrapolated to include all anglers, an estimated 8,569 of 14,929 active anglers were successful in catching a steelhead (Table 3). Of the successful anglers, 2,297 (27%) released all fish caught, 5,773 (67%) kept from one to five fish, and 468 (6%) took home more than five fish (Table 4).

For most rivers, anglers that resided in the immediate region made up the majority of the angling effort (days fished) and, similarly, caught and kept the most fish. The Thompson, Dean and a few rivers in the Skeena Mainland area, however, continued to attract a larger proportion of anglers from other resident areas (data on file).

Approximately 45% of all active steelhead anglers spent between one and five days fishing. The majority of resident anglers from areas with a large number of steelhead streams (Vancouver Island, Lower Mainland and Skeena) spent over five days angling for steelhead. This was also true of out-of-province residents, however, residents of areas in the province where there are few or no steelhead streams generally fished for only one to five days (Table 5).

Fishing effort was highest in the Lower Mainland region, closely followed by Vancouver Island. The total estimated provincial catch was 98,622 steelhead with Vancouver Island providing the largest catch of both hatchery and wild fish. The provincial catch per angler day averaged 0.57,

Table 2. Number of steelhead licencees, questionnaires and respondents by resident area.

Resident area	Licencees	Questionnaires mailed	Response	Not useable*	Response rate (%)	Licencees sampled (%)
Vancouver Island	3,608	2,097	847	162	44	24
Lower Mainland	7,152	4,157	1,820	308	47	25
Thompson-Nicola	902	568	296	14	53	33
Kootenay	167	88	43	7	53	26
Cariboo	872	549	256	25	49	29
Skeena	4,039	2,512	990	192	43	25
Omineca-Peace	1,141	712	330	40	49	29
Okanagan	533	319	172	21	58	32
Non-Resident Canadians	736	671	331	53	54	45
Non-Resident Aliens	1,426	1,418	744	76	55	52
Total	20,576	13,091	5,829	898	47.8	28.3

*Includes questionnaires that:
1. were returned by the post office as undeliverable, or
2. were spoiled

Table 3. Estimate of active and successful steelhead anglers by resident area.

Resident area	Licencees	Active anglers	Active anglers (%)	Successful anglers	Successful anglers (%)
Vancouver Island	3,608	2,623	73	1,912	73
Lower Mainland	7,152	4,856	68	2,530	52
Thompson-Nicola	902	704	78	292	42
Kootenay	167	148	88	66	45
Cariboo	872	576	66	238	41
Skeena	4,039	2,815	70	1,672	59
Omineca-Peace	1,141	809	71	390	48
Okanagan	533	453	85	216	48
Non-Resident Canadians	736	625	85	293	47
Non-Resident Aliens	1,426	1,320	93	960	73
Total	20,576	14,929	74.3	8,569	57.8

Table 4. Successful anglers in each resident area according to the number of steelhead kept.

Number of Steelhead Kept	Successful Anglers										Total Successful Anglers	
	Vancouver Island	Lower Mainland	Thompson-Nicola	Kootenay	Cariboo	Skeena	Omineca-Peace	Okanagan	Non-Resident Canadian	Non-Resident Alien	No.	%
0	561	721	30	8	41	248	52	30	44	562	2,297	26.7
1-5	1,145	1,726	244	58	194	1,265	328	183	245	385	5,773	67.4
6-10	193	71	18	0	3	155	10	3	4	11	468	5.5
11-20	9	8	0	0	0	4	0	0	0	2	23	0.3
over 20	4	4	0	0	0	0	0	0	0	0	8	0.1
Total Anglers	1,912	2,530	292	66	238	1,672	390	216	293	960	8,569	100.0

Table 5. Active anglers in each resident area according to the number of angler days.

Number of Angler Days	Active Anglers										Total Active Anglers	
	Vancouver Island	Lower Mainland	Thompson-Nicola	Kootenay	Cariboo	Skeena	Omineca-Peace	Okanagan	Non-Resident Canadian	Non-Resident Alien	No.	%
1-5	890	2,048	397	93	348	1,138	589	298	3	584	6,744	45.2
6-10	464	999	152	47	157	612	169	115	196	577	3,488	23.4
11-30	839	1,219	140	8	61	722	48	37	56	125	3,255	21.8
Over 30	404	511	15	0	7	298	3	0	7	21	1,266	8.5
Unknown	26	79	0	0	3	45	0	3	7	13	176	1.1
Total Anglers	2,623	4,856	704	148	576	2,815	809	453	625	1,320	14,929	100.0

Table 6. 1983-84 Angling effort and steelhead catch distribution*

Area	Angler days	Wild		Hatchery		Total catch	Kept/day	Catch/day**
		Kept	Released	Kept	Released			
Vancouver Island	47,777	1,547	32,575	2,953	10,007	47,082	0.095	0.985
Lower Mainland	50,477	804	12,615	1,404	3,148	17,971	0.044	0.355
Thompson-Nicola	13,530	1,583	2,083	38	72	3,776	0.119	0.279
Cariboo	9,425	880	5,552	9	36	6,477	0.087	0.747
Skeena - Mainland	46,887	4,874	14,152	98	298	19,422	0.105	0.412
- Q.C.I.	4,654	870	2,926	4	41	3,837	0.185	0.821
Omineca-Peace	5	0	0	0	0	0	0.000	0.000
Unknown streams	686	20	23	4	10	57	0.036	0.102
Total	173,432	10,578	69,926	4,506	13,612	98,622	0.087	0.566

* From Appendix 1.
** Combined kept and released.

Table 7. Steelhead streams having the highest total catch in 1983-84.

Streams	Angler days	Kept	Released	Total catch	Kept/ day	Catch/ day
VANCOUVER ISLAND						
Gold	4,320	304	8,673	8,977	0.071	2.066
Stamp	8,132	1,401	6,884	8,285	0.172	1.009
Cowichan	6,305	409	3,901	4,310	0.064	0.682
Campbell/Quinsam	5,308	344	2,970	3,314	0.065	0.624
Big Qualicum	3,300	540	2,470	3,010	0.164	0.929
Little Qualicum	2,799	262	2,480	2,742	0.094	0.978
LOWER MAINLAND						
Chilliwack/Vedder	16,799	883	8,803	9,686	0.053	0.576
Alouette (South)	4,492	260	1,411	1,671	0.058	0.372
Capilano	3,070	114	1,127	1241	0.037	0.404
Seymour	3,582	67	998	1,065	0.019	0.279
Little Campbell	2,122	149	755	904	0.070	0.426
Fraser	11,585	539	225	764	0.047	0.068
THOMPSON-NICOLA						
Thompson	12,295	1,481	1,988	3,469	0.119	0.284
CARIBOO						
Dean	4,337	264	3,545	3,809	0.056	0.911
Atnarko/Bella Coola	3,950	403	1,508	1,911	0.102	0.483
SKEENA MAINLAND						
Bulkley	10,338	1,102	3,455	4,557	0.105	0.464
Morice	4,939	477	2,571	3,048	0.093	0.667
Skeena	11,423	1,191	1,658	2,849	0.108	0.246
Babine	1,967	89	1,337	1,426	0.047	0.825
Kitsumkalum	3,752	405	729	1,134	0.108	0.299
QUEEN CHARLOTTE ISLANDS						
Yakoun	2,903	580	1,942	2,522	0.203	0.874
Pallant	232	39	330	369	0.169	1.593
Copper	367	37	248	285	0.105	0.758
Tlell	432	81	130	211	0.185	0.481

which means that it took an average of 1.8 days to catch a steelhead (Table 6).

Anglers kept an average of 18% of the provincial steelhead catch, ranging from a low of 10% on Vancouver Island (under special regulation to limit harvest) to a high of 43% in the Thompson-Nicola area. The most heavily fished stream in the province was the Chilliwack/Vedder which also had the highest reported total catch (kept and released) of 9,686 fish followed by the Gold (8,977), Stamp (8,285), Bulkley (4,557) and Cowichan (4,310) rivers. Hatchery fish made up a sizeable component of the catch for the Chilliwack/Vedder (21%) and Stamp (56%) rivers. Hatchery fish comprised approximately 18% of the total provincial catch. The reported release ratio for hatchery fish averaged 67% compared to 85% for wild fish (Appendix 1).

DISCUSSION

TRENDS IN CATCH AND ANGLING EFFORT

While the annual reported catch has fluctuated between 39,500 and 98,600 fish since 1966, there has been a steady decrease in licence sales and the number of active anglers. The number of successful anglers, however, has remained relatively constant suggesting that the least successful anglers probably drop out leaving the streams available to a group of more experienced fishermen (Fig. 2). A significant increase in the provincial steelhead catch this year resulted in an average catch (kept and released) of 11.5 fish per successful angler; the highest on record. The increase in total catch also meant that it took less angling effort to land a fish, with an average of only 1.8 days of angling required per fish caught; the lowest on record. Angling effort also increased substantially. In fact, on average, each angler devoted more time to fishing for steelhead this year than in the previous 10 years (Appendix 2).

The provincial steelhead catch has recovered dramatically over the past few years. This can be attributed to an increase in stock abundance in many streams resulting from a combination of factors: (1) an improvement in wild juvenile recruitment, (2) supplemental stocking with hatchery fry and smolts, (3) reduced quotas, and (4) catch and release restrictions (introduced in 1976) that limit harvest and, thus, increase spawning escapement. The increase in reported catch is also partially due to repeated captures of released fish. The number of steelhead kept has been declining steadily, dropping from 63% in 1970-71 to 18% in 1983-84. Angler philosophy is changing as more fishermen realize that the future status of our steelhead stocks depends on maintaining a lower rate of harvest (Fig. 3; Appendix 3).

Provincial angling effort is on a slow upswing after an all-time low which occurred in 1981-82 (Fig.3). Vancouver Island, in particular, showed a noticeable increase over the last two years recovering from a three year slump. Catch per angler day, which is a reflection of angling success, remained favourably high in all regions with Vancouver Island and the Lower Mainland experiencing the highest angler success rate (Fig. 4) and total catch (Fig. 5) on record.

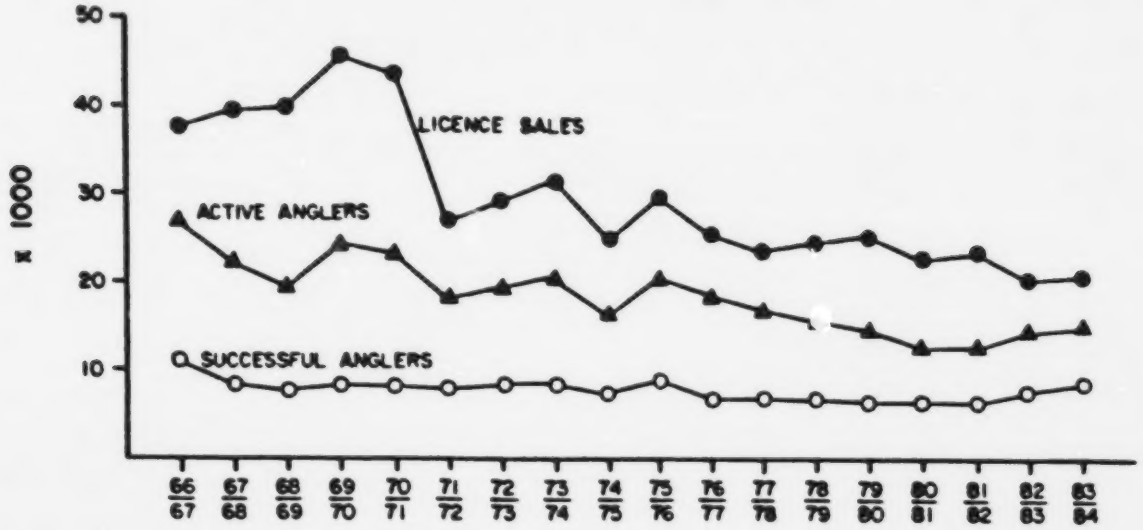

Fig. 2. Annual variations in steelhead licence sales and the number of active and successful steelhead anglers in British Columbia since 1966/67.

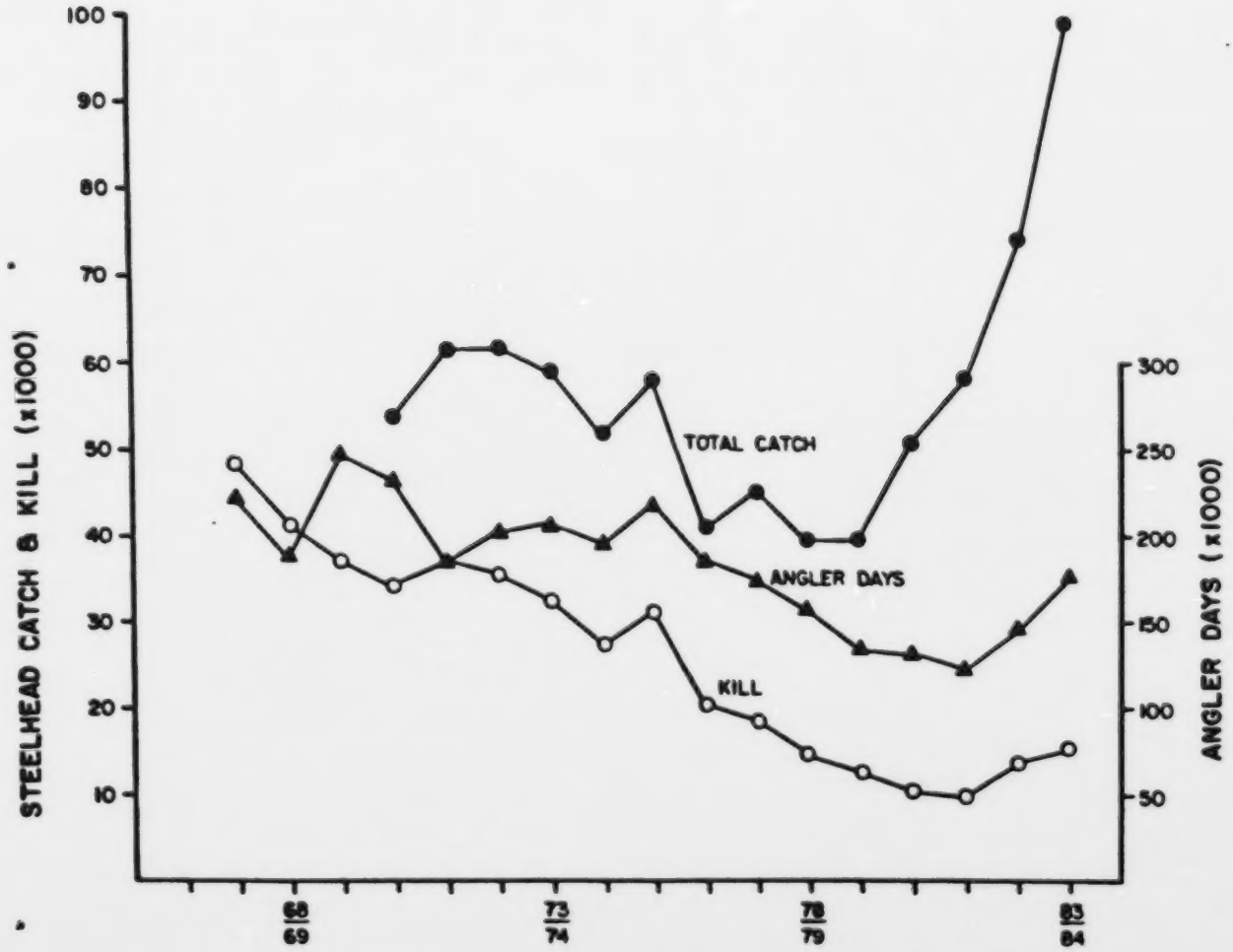

Fig. 3. Steelhead angling effort and catch success since 1967/68.

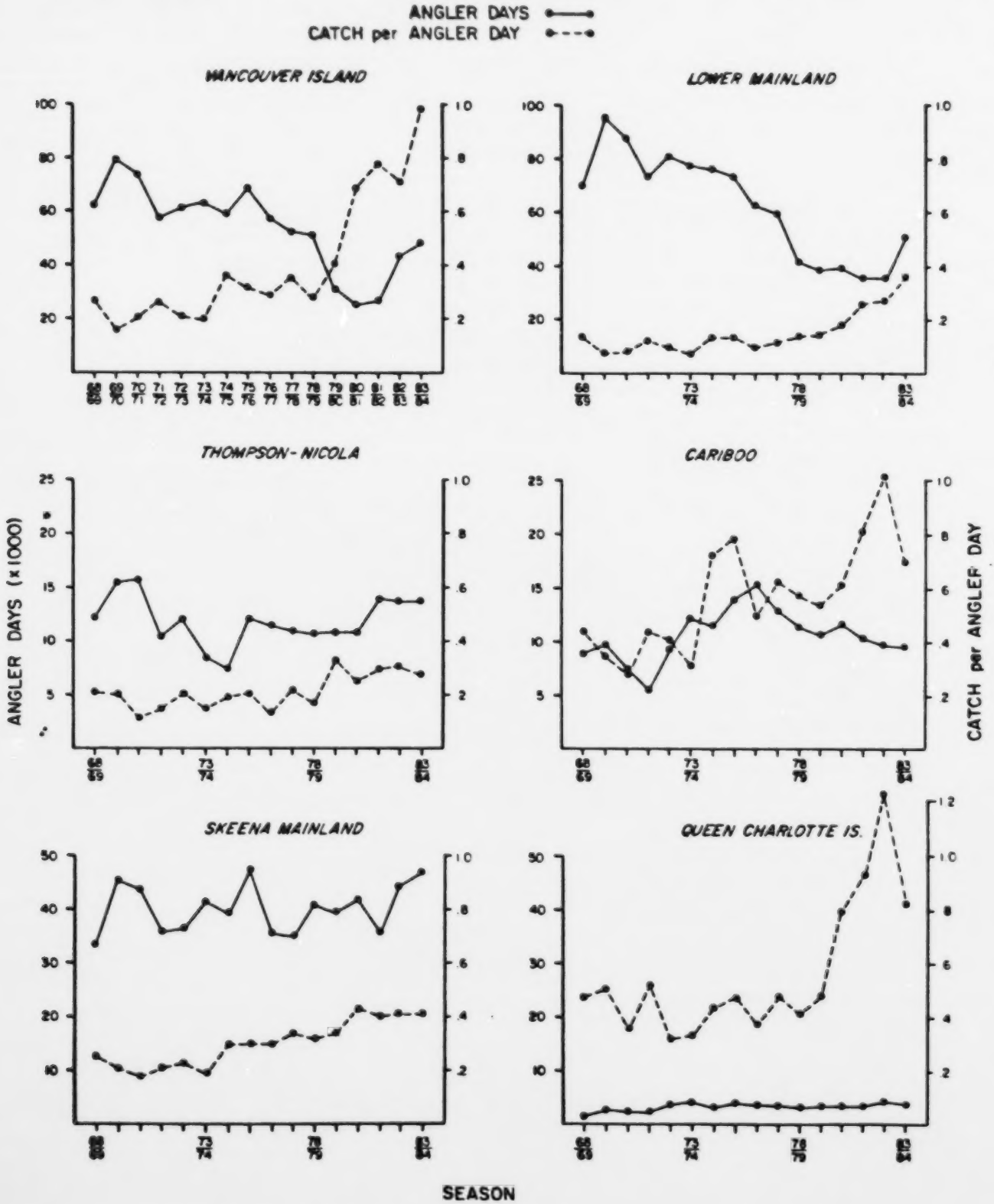

Fig. 4. Trends in steelhead angling effort and catch success for each area containing steelhead streams.

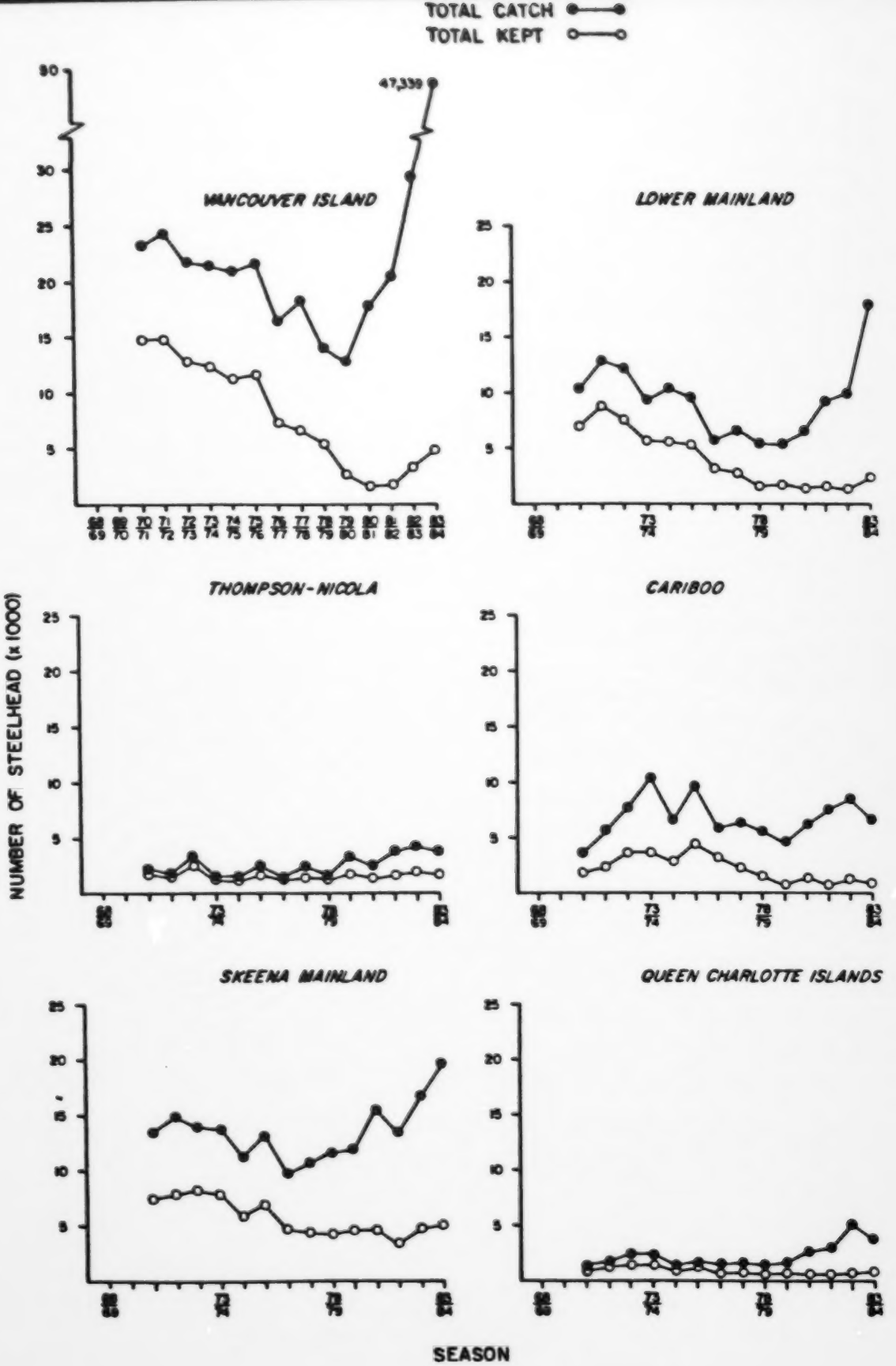

Fig. 5. Trends in total steelhead catch and kept for each area containing steelhead streams.

RESPONSE BIAS

Steelhead biologists in Oregon and Washington conducting mailout questionnaire surveys of steelhead angling success have found a "positive response bias" in their results. In British Columbia, comparative results of the Steelhead Harvest Questionnaire and on-site creel surveys suggests a similar bias indicating that the questionnaire may be producing inflated estimates of the steelhead catch (both kept and released). For those streams receiving over 400 angler days per year (the larger, more popular streams), the kill estimates from the questionnaire averaged 32% higher than estimates obtained from on-site creel surveys. The range in error is considerable (from 4% to 63%) indicating that the 32% overestimate should be applied selectively (Steelhead Harvest Analysis 1978-79, Fish and Wildlife Bulletin No. B-8). Creel survey results also indicate that estimates of fish released and angler days are even more inflated than estimates of steelhead kept. Few anglers maintain a permanent record of fish released or the number of days spent fishing, so guesswork is often the only answer. There is also the likelihood of some dishonest responses.

The comparison of creel survey and questionnaire results are not always reliable. Creel survey techniques vary from intense sampling (Dean and Thompson rivers) and random interviews (Campbell and Quinsam rivers) to voluntary angler reports (Keogh and Chilcotin rivers). The results range from accurate to indicative, reflecting considerable differences when compared to the questionnaire survey.

Throughout the years, the results of the Steelhead Harvest Analysis have been derived from a 50% response rate to a single mailout of the questionnaire. It has generally been assumed that the keenest, most active, and most successful anglers are the ones most likely to complete the questionnaire. If this was the case, when the number of fish reported caught was extrapolated to include all anglers, the resulting estimates would be inflated or positively biased due to the poor representation of inactive or dissatified anglers.

In 1978-79, and again in 1982-83, a second mailing of the questionnaire was undertaken to increase the response rate and, thus, attemp to arrive at a more accurate estimate of angling activity and success. When the results of both mailings were combined, the decrease in estimates of active anglers, successful anglers, angler days and total catch supported the possibility of response bias. If the majority of the remaining nonrespondents were found to be inactive or unsuccessful, as generally assumed, the estimates of active and successful anglers from the first mailing would be reduced considerably more. The results of a follow-up telephone survey in 1982-83 of a small random sample of Vancouver Island resident anglers who did not respond to either mailing, however, did not support the theory of response bias. Further effort is necessary in order to determine a reasonable estimate of response bias, either through multiple mailing of the questionnaire or a telephone survey on a much broader scale. In the meantime, the analysis results present a useful indication of increasing and decreasing trends in stock status and angling activity.

Appendix 1. Estimated angler days and catch success, 1983-84.*

Stream Name	Days fished	No. anglers	WILD		HATCHERY		TOTAL CATCH		Kept/ day**	Catch/ day**
			Kept	Released	Kept	Released	Kept	Released		
VANCOUVER ISLAND:										
ADAM RIVER	66	15	0	94	0	0	0	94	0.000	1.375
AHNUHATI RIVER	12	4	0	0	0	0	0	0	0.000	0.000
AMOR DE COSMOS RIVER	156	71	17	253	8	13	25	266	0.162	1.865
ARTLISH RIVER	6	6	3	0	0	0	3	0	0.500	0.500
ASH RIVER	108	39	0	75	4	26	4	101	0.038	0.962
ATLATZI RIVER	8	4	0	0	0	0	0	0	0.000	0.000
BIG QUALICUM RIVER	3300	604	59	1145	481	1325	540	2470	0.167	0.929
BLACK CREEK	21	8	0	4	0	0	0	4	0.000	0.200
BROWNS RIVER	34	17	0	4	0	0	0	4	0.000	0.125
BURMAN RIVER	45	15	21	113	0	0	21	113	0.455	2.909
CAMPBELL RIVER	2871	418	21	959	211	598	232	1557	0.081	0.613
CAYCUSE RIVER	102	40	4	90	0	0	4	90	0.038	0.885
CAYEGHLE CREEK	12	8	0	0	0	0	0	0	0.000	0.000
CHEMAINUS RIVER	97	32	0	9	0	0	0	9	0.000	0.087
CHERRY CREEK	3	3	0	0	0	0	0	0	0.000	0.000
CHINA CREEK	87	28	0	111	0	0	0	111	0.000	1.238
CLEAR RIVER	4	4	0	0	0	0	0	0	0.000	0.000
CLUXEWE RIVER	526	102	77	622	9	132	86	754	0.160	1.600
COLEMAN CREEK	4	4	0	26	0	0	0	26	0.000	6.000
CONUMA RIVER	170	47	9	124	0	4	9	128	0.050	0.800
COUS CREEK	29	17	0	47	0	0	0	47	0.000	1.571
COWICHAN RIVER	6305	689	322	3765	87	136	409	3901	0.064	0.682
CYPRE RIVER	4	4	0	0	0	0	0	0	0.000	0.000
DAVIE RIVER	89	17	0	34	0	0	0	34	0.000	0.381
DRAW CREEK	12	4	0	0	0	0	0	0	0.000	0.000
ENGLISHMAN RIVER	1186	253	0	952	68	477	68	1429	0.056	1.270
EVE RIVER	83	37	0	85	0	0	0	85	0.000	1.000
FRENCH CREEK	45	20	0	12	0	0	0	12	0.000	0.273
GOLD RIVER	4320	640	282	8623	22	50	304	8673	0.071	2.066
GOLDSTREAM RIVER	299	34	0	124	0	0	0	124	0.000	0.414
GOODSPEED RIVER	442	45	16	182	0	0	16	182	0.038	0.452
GORDON RIVER	115	21	9	103	0	4	9	107	0.074	1.000
HARRIS CREEK	390	120	42	333	0	0	42	333	0.106	0.947
HEBER RIVER	98	29	0	285	0	0	0	285	0.000	2.792
KAIPIT CREEK	59	17	0	13	0	0	0	13	0.000	0.214
KAKWEIKEN RIVER	23	7	4	4	0	0	4	4	0.167	0.333
KAOUK RIVER	17	8	0	9	0	0	0	9	0.000	0.500
KEITH RIVER	4	4	0	0	0	0	0	0	0.000	0.000
KEOGH RIVER	632	145	4	493	51	553	55	1046	0.087	1.740
KENNEDY RIVER	2	2	0	0	0	0	0	0	0.000	0.000
KIRBY CREEK	59	12	9	30	0	0	9	30	0.143	0.643
KITSUCKSUS CREEK	8	4	0	4	0	0	0	4	0.000	0.500
KOKISH RIVER	168	37	4	176	0	0	4	176	0.025	1.075
KOKSILAH RIVER	273	77	34	81	4	0	38	81	0.138	0.431
KOPRINO RIVER	21	8	0	26	0	0	0	26	0.000	1.200

Stream Name	Days fished	No. anglers	WILD		HATCHERY		TOTAL CATCH		Kept/ day**	Catch/ day**
			Kept	Released	Kept	Released	Kept	Released		
LEINER RIVER	250	32	13	162	0	0	13	162	0.051	0.695
LITTLE QUALICUM RIVER	2799	452	4	1559	258	921	262	2480	0.094	0.978
LITTLE ZEBALLOS RIVER	12	4	0	4	0	0	0	4	0.000	0.333
MACJACK RIVER	4	4	0	0	0	0	0	0	0.000	0.000
MACKAY CREEK	12	4	0	128	0	0	0	128	0.000	10.000
MAGGIE RIVER	5	5	0	0	0	0	0	0	0.000	0.000
MAHATTA RIVER	3	3	0	12	0	0	0	12	0.000	3.000
MALKSOPE RIVER	11	3	4	0	0	0	4	0	0.333	0.333
MARBLE RIVER	247	61	0	189	0	0	0	189	0.000	0.763
MEGIN RIVER	3	3	0	4	0	0	0	4	0.000	1.000
MOHUN CREEK	141	24	4	36	0	0	4	36	0.029	0.286
MUIR CREEK	59	17	0	4	0	0	0	4	0.000	0.071
NAHMINT RIVER	55	34	0	145	0	0	0	145	0.000	2.615
NAHWITTI RIVER	254	75	12	263	0	0	12	263	0.050	1.083
NANAIMO RIVER	2492	287	55	1084	17	21	72	1105	0.029	0.459
NANOOSE CREEK	17	8	0	17	0	0	0	17	0.000	1.000
NESOOK RIVER	21	17	0	17	0	0	0	17	0.000	0.800
NIMPKISH RIVER	976	150	70	903	4	0	74	903	0.081	1.026
NITINAT RIVER	107	34	4	59	0	0	4	59	0.036	0.607
OYSTER RIVER	1025	208	3	469	97	565	100	1034	0.105	1.117
PACHENA RIVER	4	4	0	0	0	0	0	0	0.000	0.000
PERRY RIVER	123	21	9	137	0	0	9	137	0.069	1.172
PUNTLEDGE RIVER	1118	162	9	628	64	606	73	1234	0.064	1.155
QUATSE RIVER	101	28	0	120	0	4	0	124	0.000	1.208
QUINSAM RIVER	2437	362	9	842	103	571	112	1413	0.045	0.621
ROBERTSON RIVER	8	8	0	4	0	0	0	4	0.000	0.500
RUSSIAN RIVER	106	4	13	60	0	0	13	60	0.120	0.680
SALMON RIVER	435	105	0	158	0	4	0	162	0.000	0.371
SAN JOSEF RIVER	53	24	0	26	0	0	0	26	0.000	0.462
SAN JUAN RIVER	399	127	78	387	0	0	78	387	0.200	1.180
SARITA RIVER	165	50	21	188	0	0	21	188	0.128	1.256
SOMASS RIVER	2023	153	34	644	186	567	220	1211	0.111	0.709
SOOKE RIVER	74	27	0	21	0	0	0	21	0.000	0.263
SPROAT RIVER	166	39	0	94	2	4	2	98	0.024	0.585
STAFFORD RIVER	7	3	0	0	0	0	0	0	0.000	0.000
STAMP RIVER	8132	1085	136	3522	1265	3362	1401	6884	0.172	1.009
STRANBY RIVER	29	12	0	30	0	0	0	30	0.000	1.000
SUCWOA RIVER	192	42	21	244	0	0	21	244	0.111	1.378
TAHSIS RIVER	229	32	17	170	0	0	17	170	0.074	0.815
TAHSISH RIVER	10	7	0	6	0	0	0	6	0.000	0.667
TAYLOR RIVER	12	8	0	4	0	0	0	4	0.000	0.333
TLUPANA RIVER	68	25	4	85	0	0	4	85	0.063	1.313
TOQUART RIVER	11	3	0	8	0	0	0	8	0.000	0.667
TRENT RIVER	98	29	17	137	4	0	21	137	0.217	1.609
TSABLE RIVER	190	41	9	243	4	51	13	294	0.067	1.600
TSITIKA RIVER	17	4	0	9	0	0	0	9	0.000	0.500
TSOLUM RIVER	51	29	0	9	0	0	0	9	0.000	0.167
TSOWWIN RIVER	7	7	0	0	0	0	0	0	0.000	0.000

Stream Name	Days fished	No. anglers	WILD		HATCHERY		TOTAL CATCH		Kept/ day**	Catch/ day**
			Kept	Released	Kept	Released	Kept	Released		
TSULQUATE RIVER	8	4	0	4	0	0	0	4	0.000	0.500
WAUKWAAS CREEK	12	4	0	0	0	0	0	0	0.000	0.000
WAKEMAN RIVER	7	3	0	0	0	0	0	0	0.000	0.000
WANOKANO CREEK	4	4	0	0	0	0	0	0	0.000	0.000
WAUKWASS CREEK	320	103	55	452	0	13	55	465	0.182	1.753
WHITE RIVER	25	12	0	9	0	0	0	9	0.000	0.333
WOSS RIVER	247	38	9	184	4	0	13	184	0.052	0.793
ZEBALLOS RIVER	81	21	0	85	0	0	0	85	0.000	1.053
TOTAL	47777	7778	1547	32575	2953	10007	4500	42582	0.095	0.985
LOWER MAINLAND COAST:										
ALOUETTE RIVER	4492	545	0	861	260	550	260	1411	0.058	0.372
ASHLU CREEK	102	47	4	12	0	0	4	12	0.038	0.154
BERTRAM CREEK	23	7	0	0	0	0	0	0	0.000	0.000
BIRKENHEAD RIVER	3	3	0	0	0	0	0	0	0.000	0.000
BRITTAIN RIVER	7	7	0	0	0	0	0	0	0.000	0.000
CAPILANO RIVER	3070	260	12	593	102	534	114	1127	0.037	0.404
CHAPMAN CREEK	157	39	16	55	4	16	20	71	0.125	0.575
CHEAKAMUS RIVER	1173	277	0	589	4	16	4	605	0.003	0.518
CHEHALIS RIVER	337	94	0	75	0	0	0	75	0.000	0.221
CHILLIWACK/VEDDER RIVER	16799	2018	114	7546	769	1257	883	8803	0.053	0.576
COQUIHALLA RIVER	880	197	4	145	8	39	12	184	0.013	0.222
COQUITLAM RIVER	759	95	0	193	4	12	4	205	0.005	0.269
DAKOTA CREEK	11	7	4	0	0	0	4	0	0.333	0.333
DE BOVILLE SLOUGH	27	3	0	0	0	0	0	0	0.000	0.000
DESERTED RIVER	3	3	0	0	0	0	0	0	0.000	0.000
ELAHO CREEK	55	23	0	4	0	0	0	4	0.000	0.071
FRASER RIVER	11585	876	515	221	25	4	539	225	0.047	0.068
GRAY CREEK	51	19	0	20	0	0	0	20	0.000	0.385
HARRISON RIVER	23	7	0	0	0	0	0	0	0.000	0.000
HASTINGS CREEK	3	3	0	0	0	0	0	0	0.000	0.000
HOMATHKO RIVER	15	7	0	0	0	0	0	0	0.000	0.000
INDIAN RIVER	33	17	0	16	0	0	0	16	0.000	0.444
KANAKA CREEK	98	31	0	28	4	0	4	28	0.040	0.320
LANG CREEK	558	47	79	94	0	0	79	94	0.141	0.310
LILLOOET RIVER	58	15	0	4	0	0	0	4	0.000	0.067
LITTLE CAMPBELL RIVER	2122	161	0	405	149	350	149	755	0.070	0.426
LYNN CREEK	117	39	0	20	4	8	4	28	0.033	0.267
MCNAB CREEK	35	11	0	8	0	0	0	8	0.000	0.222
MAMQUAM RIVER	39	19	0	12	0	8	0	20	0.000	0.500
MATSQUI SLOUGH	58	3	0	55	0	0	0	55	0.000	0.933
NORRIS CREEK	27	3	12	0	0	0	12	0	0.429	0.429
NICOMEKL RIVER	1025	133	0	189	8	59	8	248	0.008	0.249
NORRISH CREEK	66	23	0	16	0	0	0	16	0.000	0.235
NORTH ALOUETTE RIVER	267	23	0	8	0	4	0	12	0.000	0.044
PHILLIPS RIVER	3	3	0	0	0	0	0	0	0.000	0.000

Stream Name	Days fished	No. anglers	WILD Kept	WILD Released	HATCHERY Kept	HATCHERY Released	TOTAL CATCH Kept	TOTAL CATCH Released	Kept/ day**	Catch/ day**
PITT RIVER	11	11	0	0	0	0	0	0	0.000	0.000
QUATAM RIVER	7	7	0	0	0	0	0	0	0.000	0.000
RAINY RIVER	133	31	8	24	0	0	8	24	0.059	0.235
ROBERTS CREEK	7	3	0	8	0	0	0	8	0.000	1.000
SALMON RIVER	35	19	0	0	0	0	0	0	0.000	0.000
SECHELT CREEK	7	3	0	0	0	0	0	0	0.000	0.000
SERPENTINE RIVER	192	23	16	0	0	0	16	0	0.082	0.082
SEYMOUR RIVER	3582	336	12	735	55	263	67	998	0.019	0.297
SILVERDALE CREEK	3	3	0	4	0	0	0	4	0.000	1.000
SILVERHOPE CREEK	306	62	4	102	0	0	4	102	0.013	0.346
SLOQUET CREEK	7	3	0	0	0	0	0	0	0.000	0.000
SOUTHGATE RIVER	11	7	0	0	0	0	0	0	0.000	0.000
SQUAMISH RIVER	1437	417	0	517	0	8	0	525	0.000	0.360
STAVE RIVER	396	31	0	24	8	20	8	44	0.020	0.129
SUMAS RIVER	180	11	4	0	0	0	4	0	0.022	0.022
TEAQUAHAN RIVER	7	3	0	0	0	0	0	0	0.000	0.000
VANCOUVER RIVER	7	7	0	0	0	0	0	0	0.000	0.000
WEAVER CREEK	47	19	0	16	0	0	0	16	0.000	0.333
WEST CREEK	3	3	0	0	0	0	0	0	0.000	0.000
WHONOOK CREEK	15	7	0	12	0	0	0	12	0.000	0.750
WIDGEON CREEK	3	3	0	4	0	0	0	4	0.000	1.000
TOTAL	50477	6074	804	12615	1404	3148	2208	15763	0.044	0.355
THOMPSON-NICOLA:										
ADAMS RIVER	7	3	0	16	0	0	0	16	0.000	2.000
BRIDGE RIVER	296	40	50	53	0	0	50	53	0.165	0.330
CAYOOSH RIVER	167	18	15	21	0	0	15	21	0.091	0.218
NAHATLATCH RIVER	132	56	17	20	0	0	17	20	0.139	0.278
NICOLA RIVER	99	7	6	0	0	0	6	0	0.056	0.056
NORTH THOMPSON RIVER	97	37	6	0	0	0	6	0	0.065	0.065
SETON RIVER	3	3	3	0	0	0	3	0	1.000	1.000
SOUTH THOMPSON RIVER	400	81	33	45	7	12	40	57	0.099	0.231
SPIUS CREEK	15	3	3	0	0	0	3	0	0.200	0.200
STEIN RIVER	19	7	0	0	0	0	0	0	0.000	0.000
THOMPSON RIVER	12295	2220	1450	1928	31	60	1481	1988	0.119	0.284
TOTAL	13530	2475	1583	2083	38	72	1621	2155	0.119	0.279
CARIBOO:										
ATNARKO RIVER	531	158	63	109	0	3	63	112	0.105	0.320
BELLA COOLA RIVER	3419	539	331	1392	9	4	340	1396	0.096	0.565
CHILCOTIN RIVER	592	193	77	84	0	0	77	84	0.129	0.270
CHILKO RIVER	93	22	0	3	0	0	0	3	0.000	0.036
CHUCKWALLA RIVER	315	78	118	321	0	0	118	321	0.356	1.364
DEAN RIVER	4337	736	264	3516	0	29	264	3545	0.056	0.911
KILBELLA RIVER	71	31	16	102	0	0	16	102	0.214	1.750
NEKITE RIVER	24	11	4	25	0	0	4	25	0.167	1.167
QUESNEL RIVER	34	3	7	0	0	0	7	0	0.200	0.200
TOTAL	9416	1771	880	5552	9	36	889	5588	0.087	0.747

Stream Name	Days fished	No. anglers	WILD		HATCHERY		TOTAL CATCH		Kept/ day**	Catch/ day**
			Kept	Released	Kept	Released	Kept	Released		
SKEENA MAINLAND:										
BABINE RIVER	1967	394	87	1289	2	48	89	1337	0.047	0.825
BELL IRVING RIVER	4	4	4	0	0	0	4	0	1.000	1.000
BULKLEY RIVER	10338	1470	1064	3408	38	47	1102	3455	0.105	0.464
BULKLEY/MORICE RIVER	198	17	11	147	0	8	11	155	0.049	0.951
CANOONA RIVER	47	11	0	163	0	0	0	163	0.000	3.333
CEDAR CREEK	51	31	12	20	0	0	12	20	0.231	0.615
CHICKEN CREEK	16	8	4	0	0	0	4	0	0.250	0.250
CLORE RIVER	162	40	28	41	0	0	28	41	0.167	0.405
CRANBERRY RIVER	525	191	92	52	0	3	92	55	0.171	0.272
DAHDOCHAX CREEK	90	16	4	109	0	0	4	109	0.033	1.222
EXCHAMSIKS RIVER	19	11	0	0	0	0	0	0	0.000	0.000
GITNADOIX RIVER	4	4	0	4	0	0	0	4	0.000	1.000
INKLIN RIVER	24	3	0	0	0	0	0	0	0.000	0.000
ISHKEENICKH RIVER	42	25	21	98	0	0	21	98	0.462	2.385
KASIKS RIVER	8	8	0	0	0	0	0	0	0.000	0.000
KEMANO RIVER	448	8	29	126	0	0	29	126	0.064	0.345
KHYEX RIVER	32	4	4	16	0	0	4	16	0.125	0.625
KING-SALMON CREEK	3	3	3	0	0	0	3	0	1.000	1.000
KISPIOX RIVER	2065	369	86	769	2	0	88	769	0.037	0.423
KITEEN RIVER	127	46	20	102	0	0	20	102	0.156	0.938
KITIMAT RIVER	2646	329	419	370	0	20	419	390	0.159	0.307
KITSAULT RIVER	3	1	0	4	0	0	0	4	0.000	1.000
KITSUMKALUM RIVER	3752	567	397	725	8	4	405	729	0.108	0.299
KITWANGA RIVER	44	25	0	0	0	0	0	0	0.000	0.000
KLEANZA CREEK	10	6	4	0	0	0	4	0	0.250	0.250
KLOIYA RIVER	601	76	20	86	0	0	20	86	0.034	0.176
KOMATUA CREEK	8	8	0	20	0	0	0	20	0.000	2.500
KWINAGEESE RIVER	4	4	4	0	0	0	4	0	1.000	1.000
KWINAMASS RIVER	28	16	8	33	0	0	8	33	0.286	1.429
LAKELSE RIVER	2989	455	208	829	0	8	208	837	0.067	0.342
MEZIADIN RIVER	127	59	37	48	0	0	37	48	0.278	0.667
MORICE RIVER	4939	922	462	2525	15	46	477	2571	0.093	0.667
NAHLIN RIVER	68	11	8	48	0	0	8	48	0.118	0.824
NAKINA RIVER	61	18	10	80	0	0	10	80	0.167	1.400
NASS RIVER	123	52	29	80	0	0	29	80	0.205	0.923
SHAMES RIVER	10	3	0	0	0	0	0	0	0.000	0.000
SHEGUNIA RIVER	8	4	0	0	0	0	0	0	0.000	0.000
SICINTINE RIVER	4	4	0	4	0	0	0	4	0.000	1.000
SKEENA RIVER	11423	1339	1170	1596	21	62	1191	1658	0.108	0.246
STIKINE RIVER	12	9	2	0	0	0	2	0	0.200	0.200
SUSKWA RIVER	999	176	126	225	0	2	126	227	0.124	0.359

Stream Name	Days fished	No. anglers	WILD		HATCHERY		TOTAL CATCH		Kept/ day**	Catch/ day**
			Kept	Released	Kept	Released	Kept	Released		
SUSTUT RIVER	361	93	57	189	0	10	57	199	0.134	0.599
TAHLTAN RIVER	58	25	15	4	0	0	15	4	0.316	0.421
TAKU RIVER	25	7	2	0	0	0	2	0	0.111	0.111
TELKWA RIVER	91	43	0	2	0	4	0	6	0.000	0.074
TOBOGGAN CREEK	186	11	16	4	0	0	16	4	0.087	0.109
TROUT CREEK	158	20	21	8	4	8	25	16	0.163	0.256
TSEAX RIVER	370	120	63	206	0	0	63	206	0.170	0.726
ZOLZAP CREEK	11	3	0	0	0	0	0	0	0.000	0.000
ZYMAGOTITZ RIVER	65	16	12	20	0	0	12	20	0.188	0.500
ZYMOETZ RIVER	1533	382	315	702	4	28	319	730	0.223	0.703
TOTAL	46887	7468	4874	14152	98	298	4972	14450	0.105	0.412
QUEEN CHARLOTTE ISLANDS:										
AIN RIVER	12	4	0	0	0	0	0	0	0.000	0.000
AMUN RIVER	8	4	0	0	0	0	0	0	0.000	0.000
COPPER CREEK	367	78	37	248	0	0	37	248	0.105	0.758
DEENA CREEK	170	46	34	101	0	0	34	101	0.222	0.933
HAANS CREEK	12	4	0	4	0	0	0	4	0.000	0.333
HIELLEN RIVER	57	8	0	0	0	0	0	0	0.000	0.000
HONNA RIVER	148	41	46	102	0	0	46	102	0.308	0.974
MAMIN RIVER	269	44	57	110	0	0	57	110	0.212	0.621
PALLANT CREEK	232	34	39	330	0	0	39	330	0.169	1.593
SANGAN CREEK	40	4	0	0	0	0	0	0	0.000	0.000
SKEDANS CREEK	4	4	0	0	0	0	0	0	0.000	0.000
TLELL RIVER	432	101	81	130	0	0	81	130	0.185	0.481
YAKOUN RIVER	2903	363	576	1901	4	41	580	1942	0.203	0.874
TOTAL	4654	735	870	2926	0	41	870	2967	0.185	0.821
OMINECA-PEACE:										
STELLAKO RIVER	5	1	0	0	0	0	0	0	0.000	0.000
TOTAL	5	1	0	0	0	0	0	0	0.000	0.000
UNKNOWN STREAMS:	686	178	20	23	4	10	24	33	0.036	0.102
PROVINCIAL TOTALS:	173432	26479	10578	69926	4506	13612	15084	83538	0.087	0.566

* Anglers who did not report number of days fished are not included in this report.
** Calculated from reported number of fish caught.

Appendix 2. Steelhead licencees, active and successful anglers, catch and angling effort (1966-67 to 983-84).

Seasons	Licencees	Active Anglers	Successful Anglers	Successful Anglers (%)	Total Catch	Days Fished	Catch/ Successful Angler	Days Fished/ Active Angler	Days Fished/ Fish Caught
66-67*	37,500	27,125	11,121	41.0	66,373	N.A.	5.9	N.A.	N.A.
67-68	39,388	22,289	8,167	36.6	48,508	224,300	5.9	10.1	4.6
68-69	39,775	19,789	7,834	39.6	41,672	189,300	5.3	9.6	4.5
69-70	45,824	24,515	8,339	34.0	37,219	249,452	4.5	10.2	6.7
70-71	43,750	23,533	8,128	34.5	53,916	232,664	6.6	9.9	4.3
71-72**	26,253	18,270	7,934	43.4	61,457	184,978	7.7	10.1	3.0
72-73	28,992	19,489	8,165	41.9	61,609	203,393	7.5	10.4	3.3
73-74	31,315	20,291	8,282	41.0	58,933	208,105	7.1	10.3	3.5
74-75**	24,399	16,469	7,296	44.3	51,652	196,751	7.1	11.9	3.8
75-76	29,594	20,265	8,770	43.3	58,036	219,797	6.6	10.8	3.8
76-77	25,539	18,356	6,998	38.1	40,618	186,381	5.8	10.2	4.6
77-78	23,406	17,143	7,038	41.1	45,201	174,721	6.4	10.2	3.9
78-79	24,600	15,788	6,746	42.7	39,473	159,363	5.9	10.1	4.0
79-80	25,095	14,755	6,384	43.3	39,569	134,569	6.2	9.1	3.4
80-81	22,301	12,894	6,383	49.5	50,924	131,886	8.0	10.2	2.6
81-82	23,425	12,964	6,175	47.6	57,704	126,508	9.3	9.7	2.2
82-83**	20,856	14,475	7,686	53.1	74,109	149,195	9.6	10.3	2.0
83-84	20,576	14,929	8,569	57.8	98,622	173,962	11.5	11.7	1.8

* Estimated on the basis of incomplete licencing data.
** Increase in steelhead licence fees.

Appendix 3. Estimated annual steelhead catch (1966-67 to 1983-84).

Seasons	Wild		Hatchery		Combined Catch		Total
	Kept	Released	Kept	Released	Kept	Released	
1966-67							66,373
1967-68							48,508
1968-69							41,672
1969-70							37,219
1970-71					33,977	19,939	53,916
1971-72					36,733	24,724	61,457
1972-73					35,939	25,670	61,609
1973-74					32,720	26,213	58,933
1974-75					27,807	23,845	51,652
1975-76					31,490	26,546	58,036
1976-77					20,168	20,450	40,618
1977-78					18,154	27,047	45,201
1978-79					14,725	24,748	39,473
1979-80					12,663	26,906	39,569
1980-81					10,941	39,983	50,924
1981-82	8,640	43,139	1,361	4,600	9,965	47,739	57,704
1982-83	10,849	54,259	2,634	6,367	13,483	60,626	74,109
1983-84	10,578	69,926	4,506	13,612	15,084	83,538	98,622